

Status of Reference Event Collection

Group 2 Consortium
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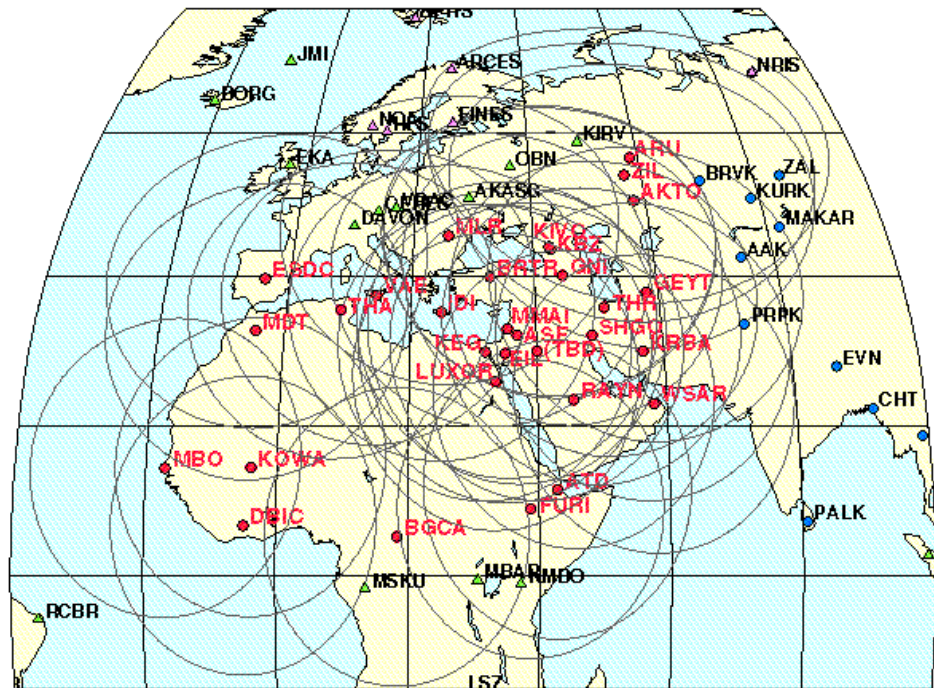
DTRA Program Review
CMR, March 5, 2001

Overview

- Objectives
- What do we consider a reference event?
- Collection of reference events
- Validation of reference events
- Reference Event List 1.0
- Future plans

Objectives

- Collect and validate reference events located with 5 km accuracy or better (GT0-5) in the Consortium's region of interest
- Reference events will be used in validating models and SSSCs.



What is a reference event?

- GT0 – known (published) location of explosions
- GT2 – event tied to a mine with a size ~ 2 km
- GT5 – local seismic network location
 - 10 or more stations within 250 km with max azimuthal gap ≤ 120 degrees;
 - closest station ≤ 30 km;
 - P/Pn recorded beyond 250 km;
 - event located using a local velocity model
- **Origin time might still be biased!**

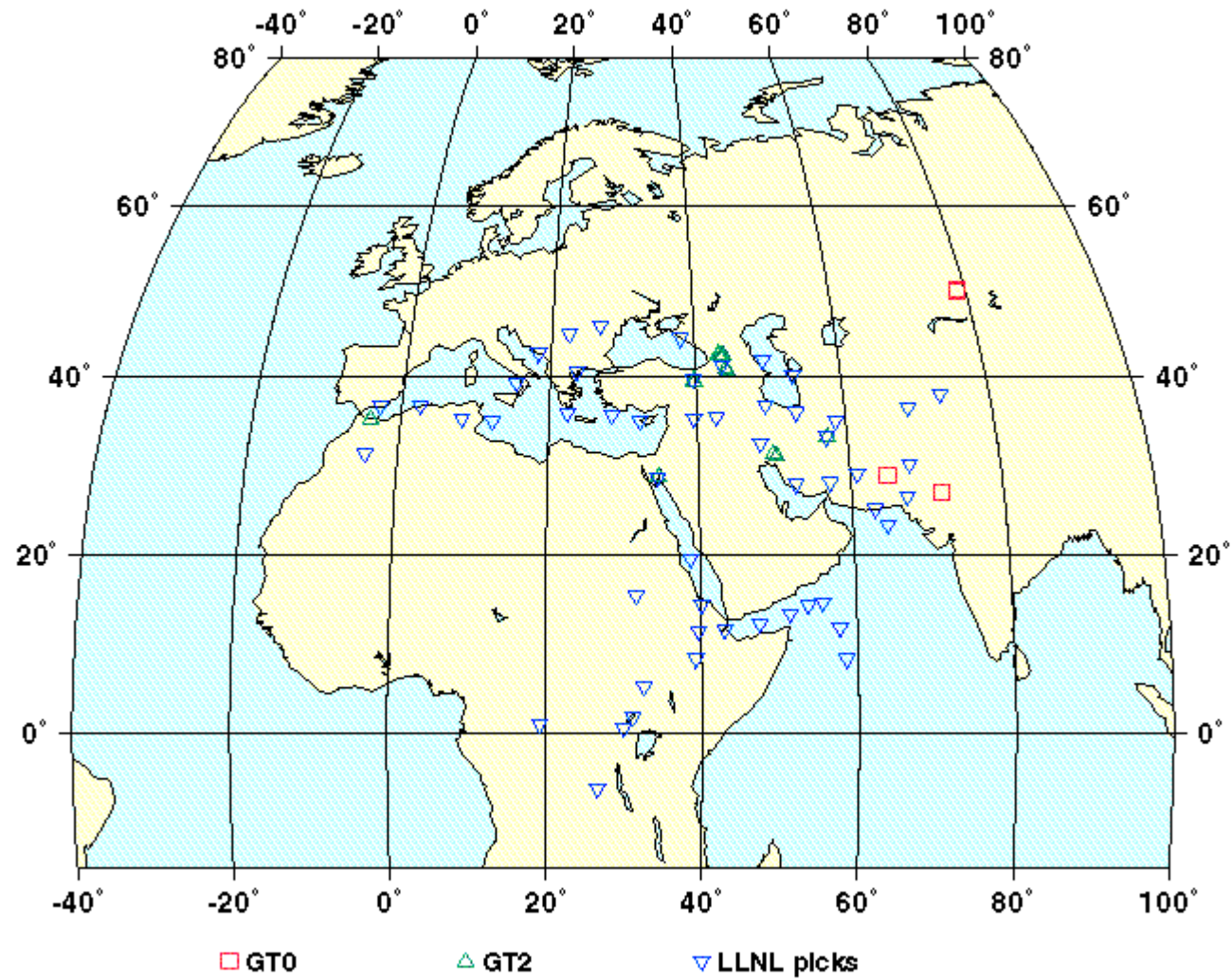
Collection of Reference Events

- Vetted CMR ground truth and explosion databases; groomed ISC data set (EHB)
- Publications (e.g. Polonaise'97, Eurobridge)
- DOE delivery
- IASPEI Working Group on Reference Events (<http://lemond.colorado.edu/~copgte>)
- Active search by Consortium members

DOE delivery

- Selected reference events/reference event candidates from LLNL
- 18 GT0 events (India, Pakistan, Kazakhstan)
- 32 GT2(?) events (1976-1995) – incorporated in HDC/JHD analysis of event clusters
- 52 events with LLNL picks (1978-1995)
- GT15 events from EHB catalogue

DOE reference events



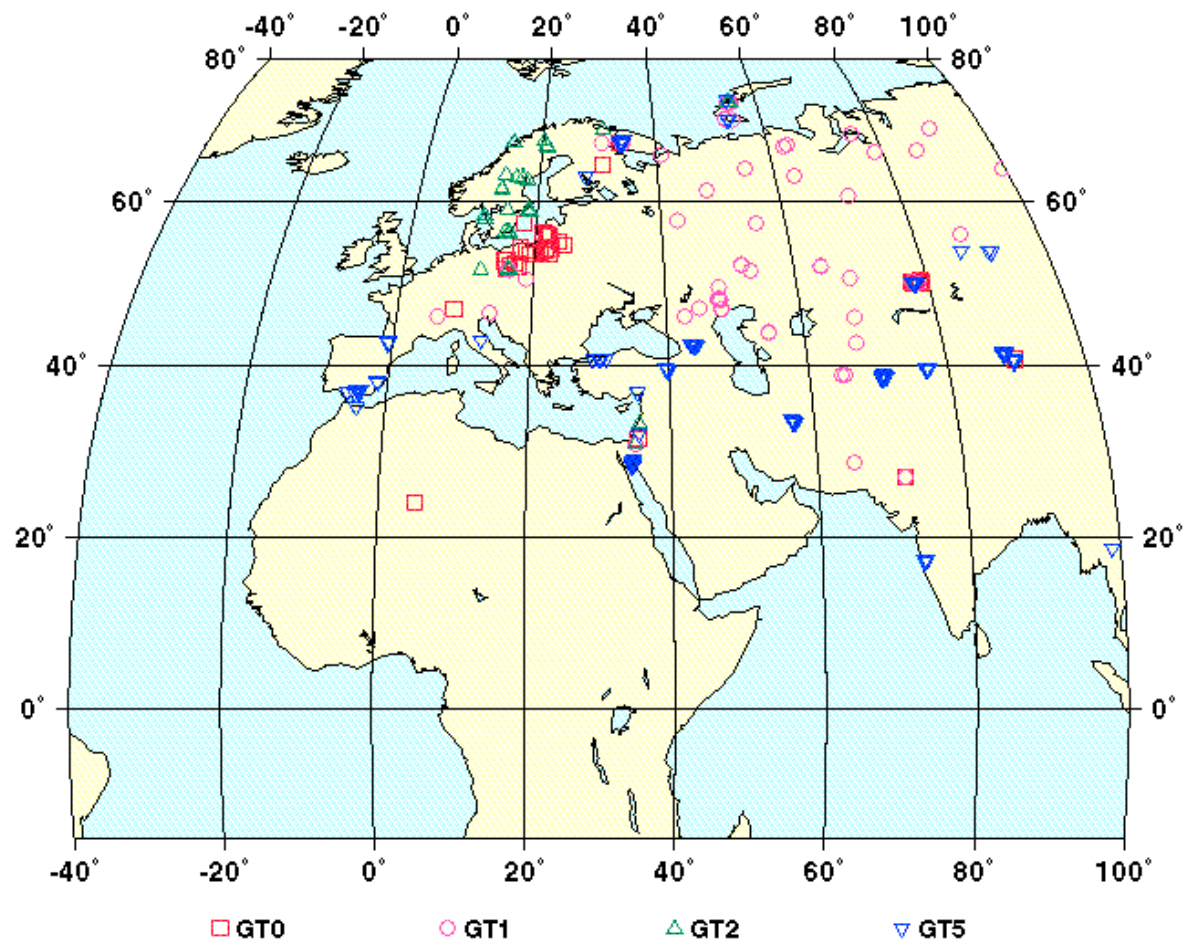
Validation of reference events

- Each reference event candidate has to be validated and documented
- Cluster analysis (HDC/JHD)
 - Validate GT5 candidate events
 - Generate more reference events with arrivals
 - Station corrections compared to model based predictions
 - Understand modeling errors

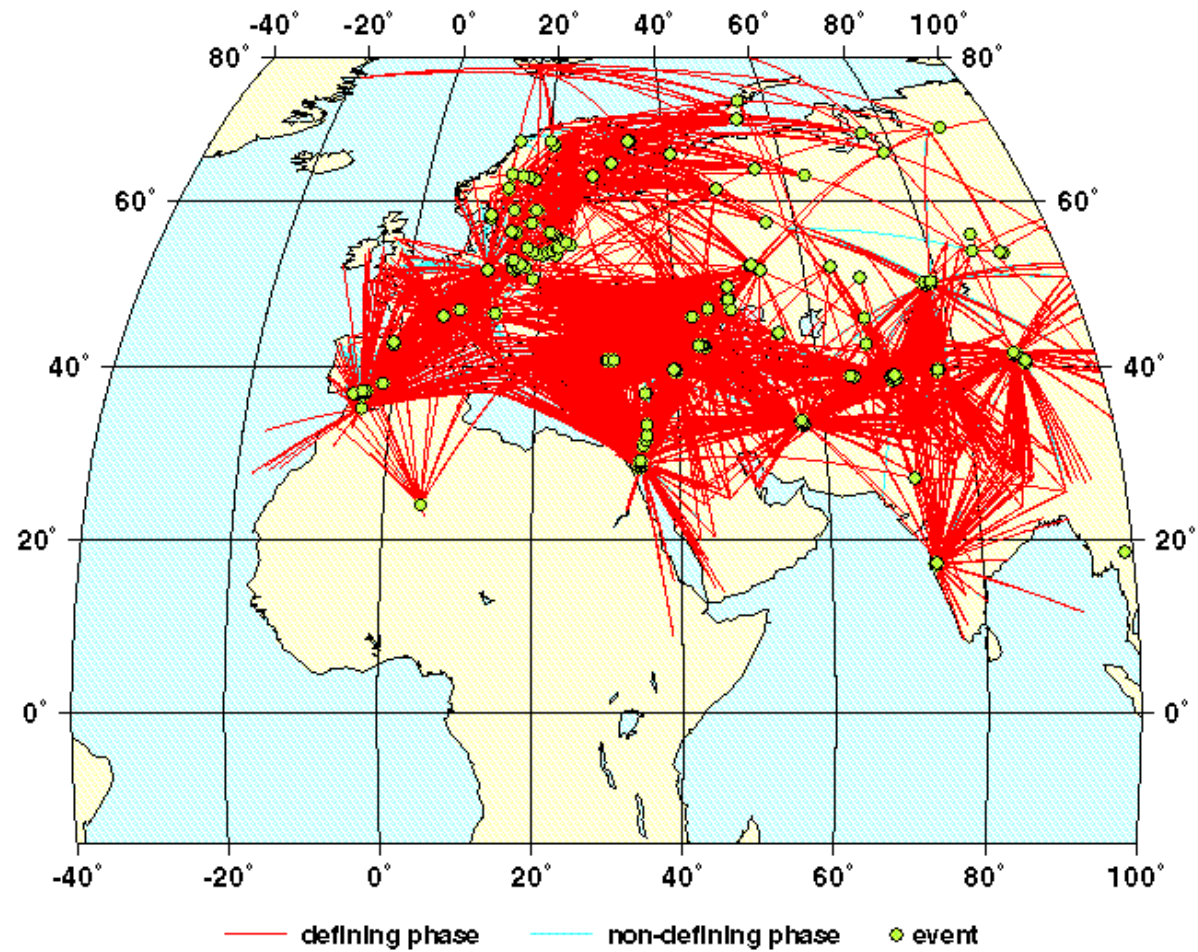
Reference Event List 1.0

- Delivered to Consortium members
- Contains 837 GT5 or better reference events
- *Publicly* available at Consortium web site:
<http://g2calibration.cmr.gov/calibration/result.html>
- RDTB delivery (June, 2001) will include:
 - Validated EHB GT5 candidates
 - Mid-ocean ridge and transform fault events
 - Further PNE station readings from Harvard
 - Further event clusters

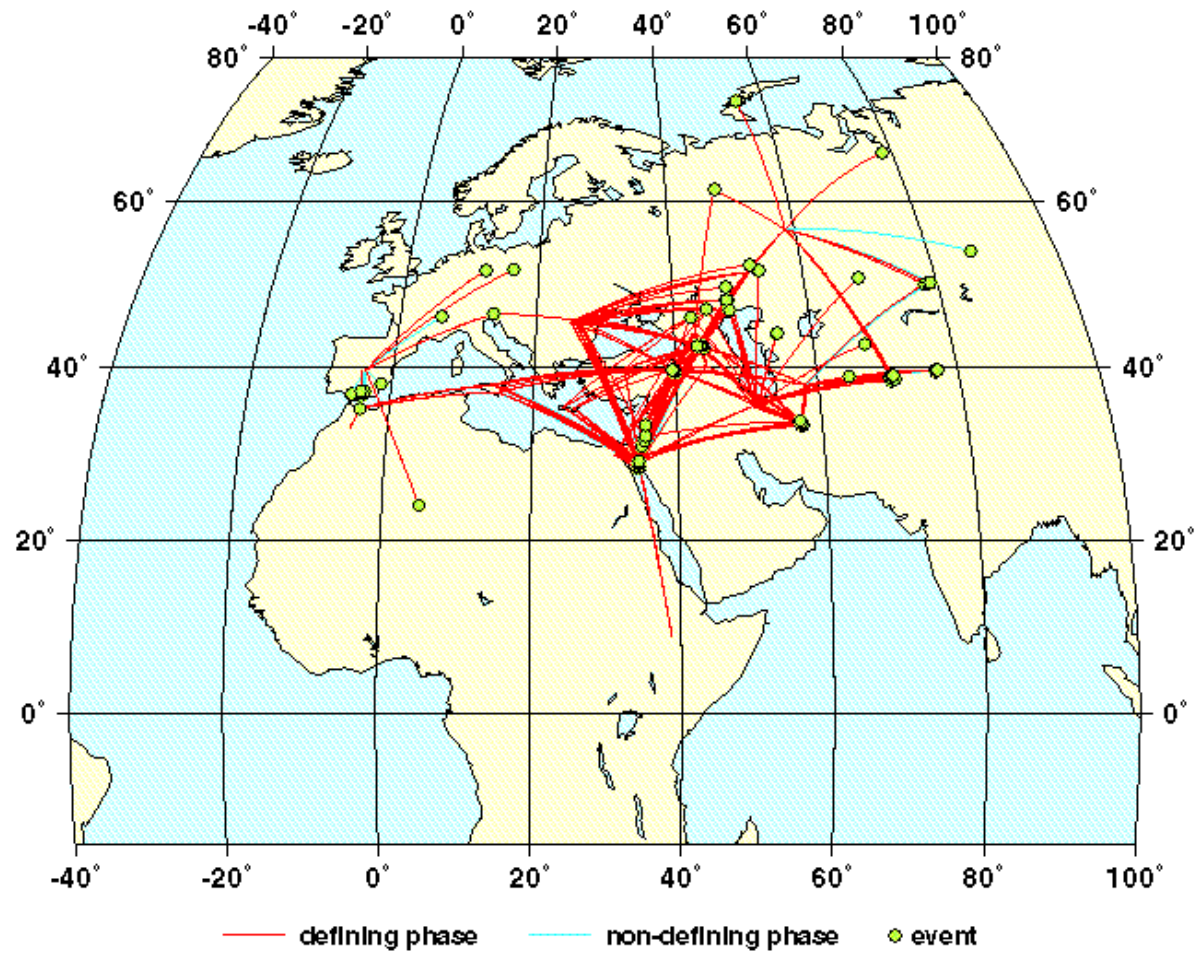
Reference Event List 1.0



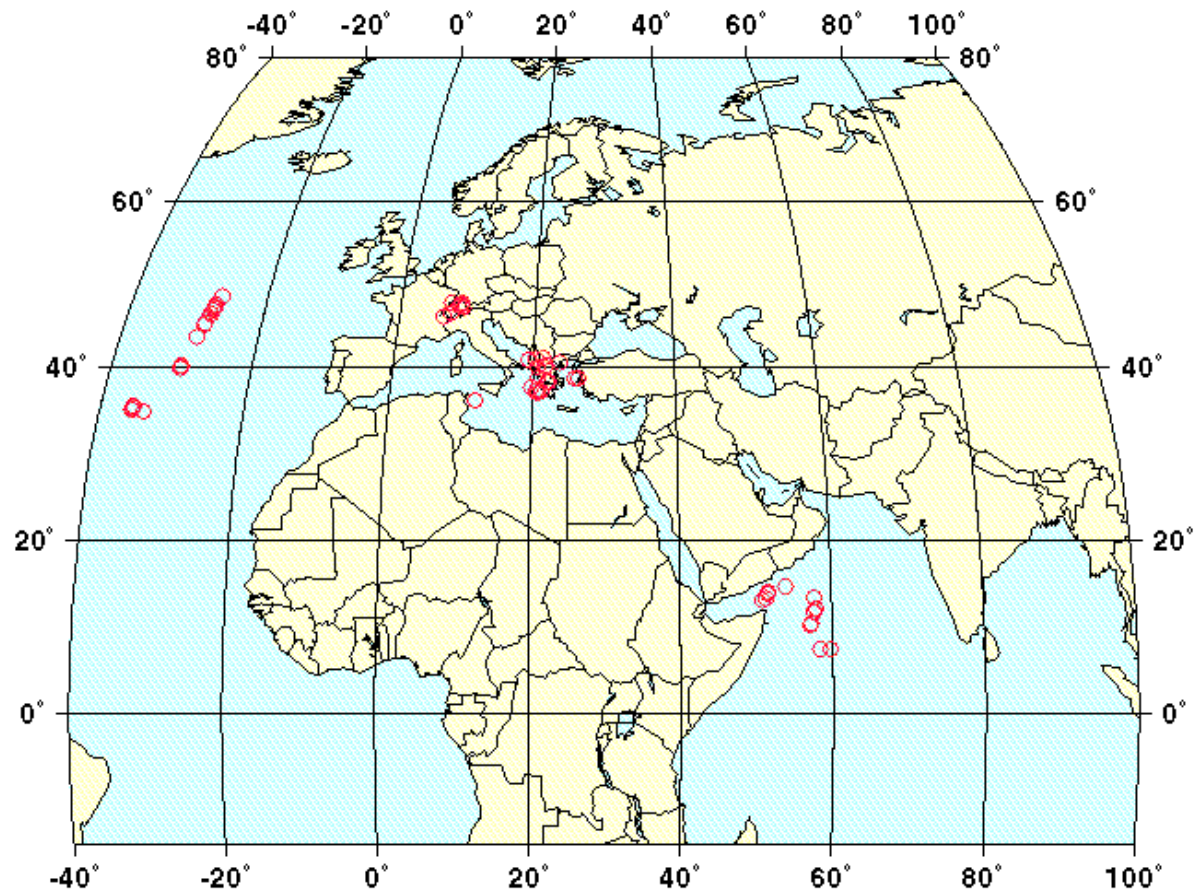
Path coverage, regional P



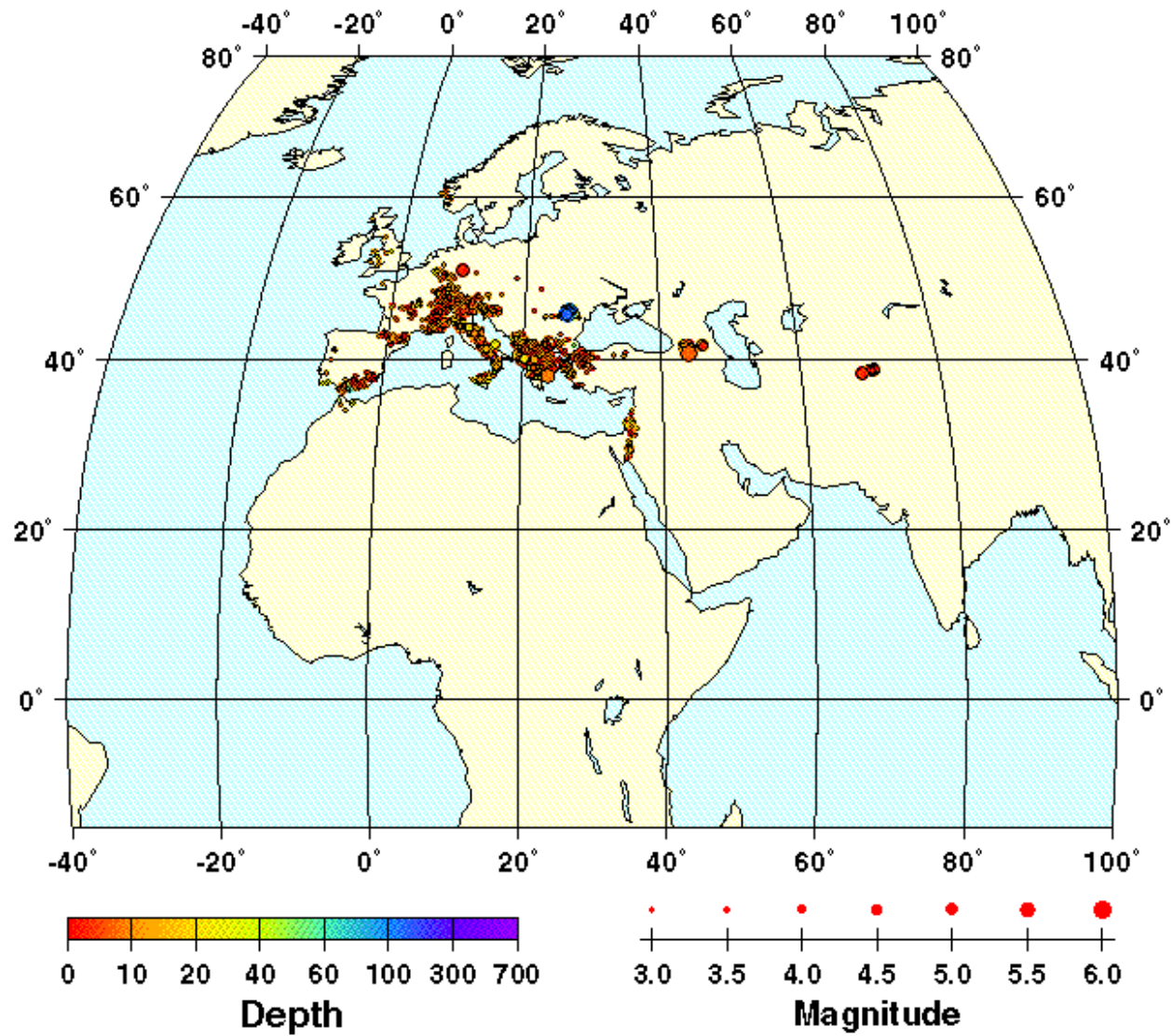
Path coverage IMS/surrogates, regional P



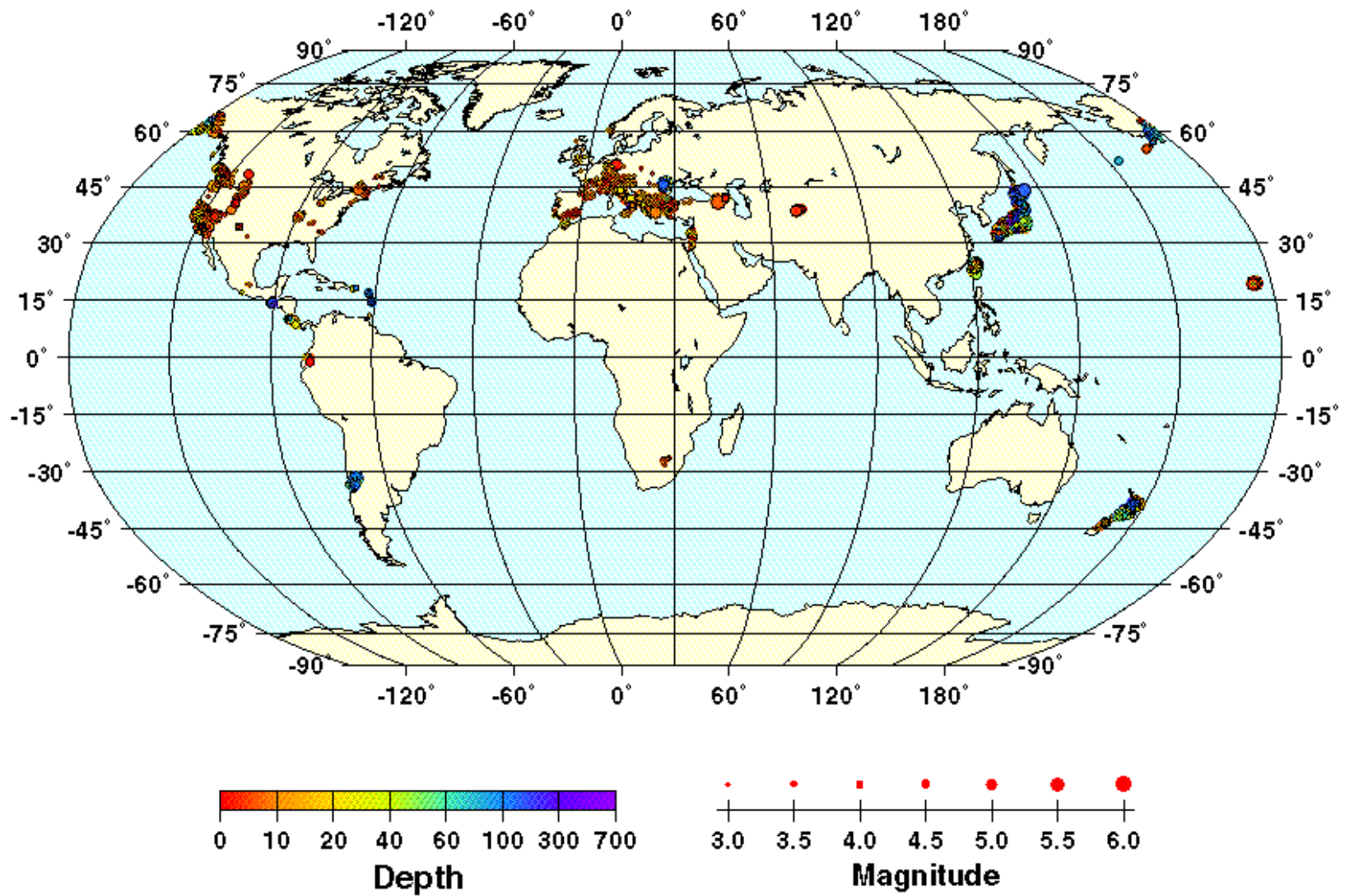
63 candidate reference events, Feb 14, 2001



6855 EHB GT5 events, Jan 10, 2001



25789 EHB GT5 events



Future plans

- Validate GT5 acceptance criteria
- Increase efforts to establish contacts in Africa
- Make every future release of the reference event list publicly available
- June – Reference Event List 1.x delivery to RDTB